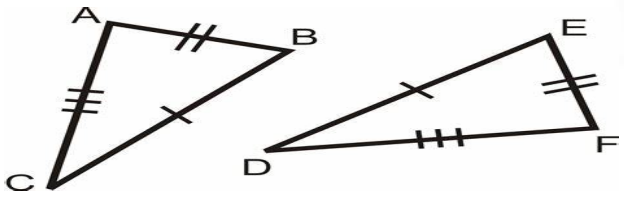
Criteria for Congruence of Triangles

There are mainly 55 conditions or rules to compare the two triangles to be congruent. They are SSS,SAS,ASA,AAS and RHS congruence properties.

1. SSS (Side – Side – Side) Congruence

If the three sides of one triangle are equal to the three sides of another triangle, then the two triangles are congruent.

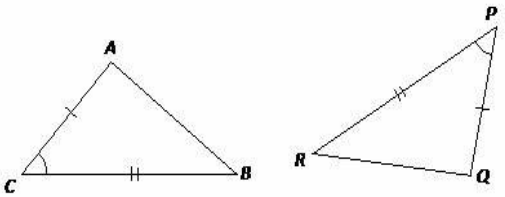


In the above-given triangles ΔABC and ΔEFD,
1.CB = DE (Corresponding equal sides shown by a single line).
2. AB = EF (Corresponding equal sides shown by two lines).
3. AC = DF(Corresponding equal angles)

Hence, the given triangles are congruent to each other.
ΔCBA≅ΔDEF

2.SAS (Side – Angle – Side) Congruence

It states that if two sides and the included angle of one triangle are congruent to two sides and included angle of another triangle, then the two triangles are congruent.



Criteria for Congruence of Triangles

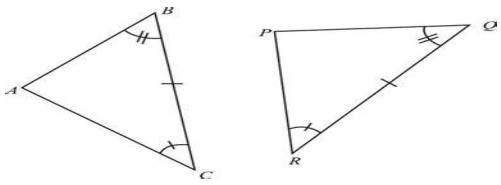
In the above-given triangles ΔABC and ΔPQR,

1. AC = PQ(Corresponding equal sides shown by a single line).
2. CB = PR (Corresponding equal sides shown by two lines).
3. ∠ACB =∠RPQ (Corresponding equal angles)

Hence, the given triangles are congruent to each other.
ΔACB≅ΔQPR

3. ASA (Angle – Side – Angle) Congruence

It states that if two angles and the included side of one triangle are congruent to two angles and included side of another triangle, then the two triangles are congruent.



In the above-given triangles ΔABC and ΔPQR,

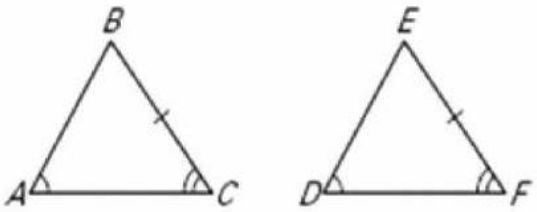
1. BC= RQ (Corresponding equal sides shown by a single line).
2. ∠ACB=∠PRQ(Corresponding equal angles shown by a single arc)
3. ∠ABC=∠PQR(Corresponding equal angles shown by two arcs)

Hence, the given triangles are congruent to each other.
ΔACB≅ΔPRQ

4. AAS (Angle – Angle – Side) Congruence

It states that if two angles and a non-included side of one triangle are congruent to two angles and a non-included side of another triangle, then the two triangles are congruent.

Criteria for Congruence of Triangles



In the above-given triangles ΔABC and ΔDEF,

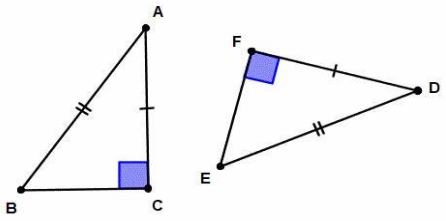
1. BC =EF(Corresponding equal sides shown by a single line).
2. ∠BAC =∠EDF (corresponding equal angles shown by a single arc)
3. ∠BCA =∠EFD (corresponding equal angles shown by two arc

Hence, the given triangles are congruent to each other.

ΔABC≅ΔDEF

5. RHS (Right Angle – Hypotenuse – Side) Congruence

It states that, if the hypotenuse and a side of a right-angled triangle are equivalent to the hypotenuse and a side of the second right-angled triangle, then the two right triangles are congruent.



In the above-given triangles ΔABC and ΔEFD,

1. AC=FD (Corresponding equal sides shown by a single line).
2. AB = ED (Corresponding equal sides shown by two lines).
3. ∠ACB =∠DFE (Right angles)

Hence, the given triangles are congruent to each other.

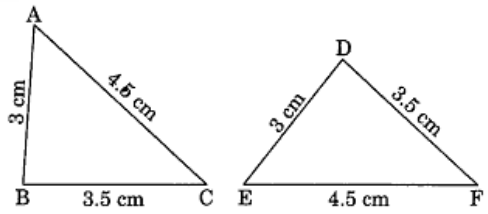
ΔABC≅ΔDEF

Criteria for Congruence of Triangles

Let us understand with an example:

Example: Examine whether the given triangles are congruent or not.

Solution: Here,



AB = DE = 3 cm

BC = DF = 3.5 cm

AC = EF = 4.5 cm

ΔABC ≅ ΔEDF (By SSS rule)

So, ΔABC and ΔEDF are congruent.